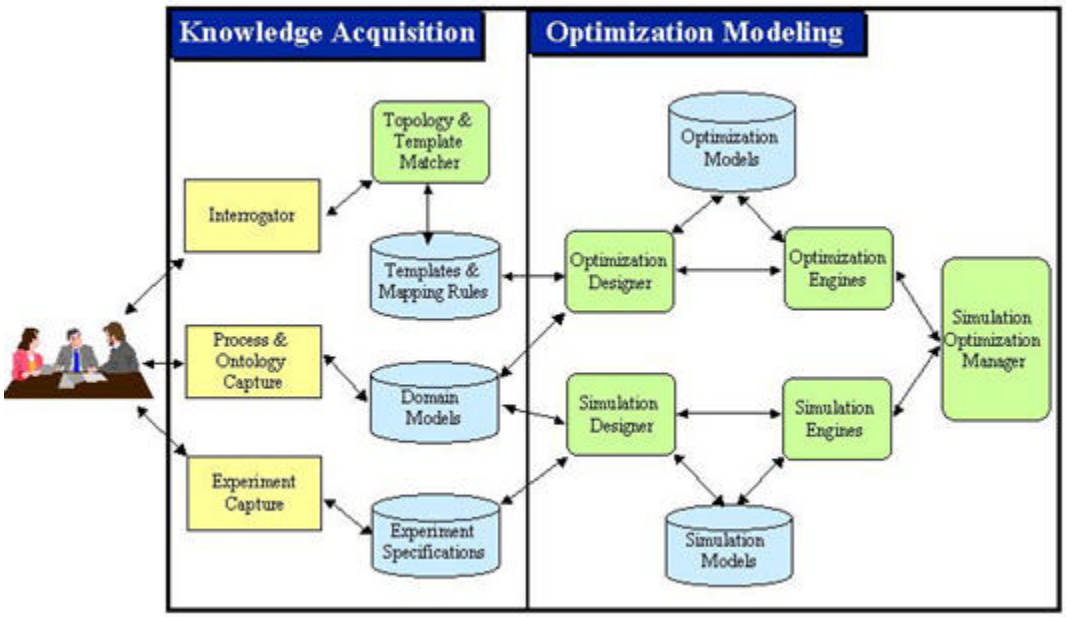
NASA Success Story

Optimization Modeling Assistant (OMA)



A Texas company specializing in artificial intelligence applications is marketing an expert software system developed under a Small Business Innovation Research (SBIR) contract with NASA at Kennedy Space Center. Knowledge Based Systems, Inc. (KBSI), of College Station, Texas has commercialized part of the Optimization Modeling Assistant (OMA) within its ProSim(tm) simulation tool. KBSI is a dynamic analysis, modeling, and systems software development company specializing in business redesign and corporate integration software and services. KBSI provide tools, training, and consulting for a wide range of enterprise needs, including business process analysis, project and cost management, activity-based costing, process and data modeling, discrete event simulation, workflow optimization, and functional analysis. The OMA is a knowledge-based software tool that facilitates optimization model development. It provides intelligent assistance for developing optimization models from structured domain descriptions. The intended users of the tool include domain experts who are unfamiliar or novice at using optimization techniques to solve their problems. The tool provides knowledge-based assistance to users in the various steps of the model development process, like knowledge acquisition, simplification, model design, interpretation of results, and sensitivity analysis. KBSI believes that the OMA will result in an increase in the use of optimization models

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in solving various manufacturing, operations planning, logistics, scheduling, and business engineering problems. ProSim(tm) is marketed as a state-of-the-art process modeling tool that can visually capture corporate knowledge of key processes and allows the user to create animated simulations and visualizations of workflow, index the distributed corporate information sources with a process knowledge map, publish the knowledge base on the World Wide Web, package and distribute standardized process knowledge with the ProSim viewer, and show cross organization processes with swimlanes.

NASA Involvement The OMA was developed under a Small Business Innovation Research (SBIR) contract with NASA at Kennedy Space Center. ProSim(tm) has been used at KSC for modeling the Shuttle flow processes. The process modeling results are useful for process redesign, activity-based costing, simulation, and training. OMA optimization tools are currently targeted for integration with the KSC Spaceport Systems Processing Model. The University of Central Florida is working with KSC on this model. Other federal efforts are using and extending OMA at Tinker Air Force Base and at the Corpus Christi Army Depot.

Social/Economic Benefit KBSI believes the NASA SBIR project will establish technology that will result in an increased use of optimization modeling to solve manufacturing, operational planning, logistics and business reengineering problems. Its approach applies knowledge-based systems techniques to the automation of the optimization design process. The OMA supports the automatic design of an optimization model from a manager's description of a problem and statement of a set question that he or she desires to answer. The project attempts to: 1) improve the capability of domain experts to provide accurate descriptions of their systems, situations, or problems; 2) improve the productivity of experienced optimization analysts in technique selection, model design, and execution; 3) facilitate effective communication between domain experts and optimization analysts; and 4) automate the design of executable optimization models.

Industry Partner
Knowledge Based Systems, Inc.

NASA Partner
Kennedy Space Center

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